Comments

TSP-0016/002

But I would just like the Department of Energy to think about cumulative risk and think about that Hanford is the most contaminated site, and I think we have taken our just and more than equitable share of the waste, and there's going to be huge impacts to my children and grandchildren, and I think that the DOE needs to take that into consideration and leave the waste that it wants to bring here in other places, safe and contained, but not risk more communities along the way by transporting it to Hanford.

Response

DOE is committed to cleaning up the Hanford Site in accordance with the Tri-Party Agreement (TPA) and applicable environmental requirements under federal and state laws and regulations. As of February 1, 2003, DOE had met 99% of its TPA milestones on or ahead of schedule. A lot in the way of cleanup has happened at Hanford over the last decade. Portions of the site have already been cleaned up, removed from the National Priority List (NPL), and released for other uses (e.g., the 1100 Operable Unit). As part of the river corridor cleanup, DOE is remediating contaminated soil sites, decommissioning the plutonium production reactors and associated facilities, removing production reactor fuel from the K Basins to interim storage in the 200 Area, and treating groundwater contaminated by past operations. Groundwater contamination beneath the Hanford Site is being studied and remediated by the ongoing CERCLA program in accordance with the Tri-Party Agreement. See Volume II Appendix N, Section N.2.4. See Volume III Section 2.0, Item 6 of the CRD for more examples of cleanup at Hanford.

DOE is responsible for the cleanup of dozens of sites around the country. DOE’s approach is to consolidate and dispose of radioactive waste from all its cleanup efforts in the safest and most cost-effective manner possible. Hanford and other sites would be available for the disposal of low-level waste and mixed low-level waste; WIPP is used for the disposal of TRU waste; Yucca Mountain is expected to be used for the disposal of high-level waste and spent nuclear fuel. Many more curies of waste will be sent offsite from Hanford than will be received from offsite. Analysis indicates that these wastes could be handled without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities.

The Hanford clean-up effort is expected to be completed in 2035, followed by a long-term stewardship program that ensures waste remaining onsite is appropriately managed.

The HSW EIS uses the definition of cumulative impact as defined by the CEQ Regulations (40 CFR 1508.7): “Cumulative impact” is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Potential cumulative impacts associated with implementing the HSW EIS alternative groups are summarized in Volume I Section 5.14. Past, current, and future Hanford activities include treatment and disposal of tank waste, CERCLA remediation projects, previously disposed of waste, decontamination and decommissioning of the Hanford production reactors and other facilities, waste in the PUREX tunnels, operation of a commercial LLW disposal facility by U.S. Ecology, and operation of the Columbia Generating Station by Energy Northwest. Cumulative impacts of storage, treatment, and disposal activities for a range of waste volumes are evaluated and expanded in the final HSW EIS. For most resource and potential impact areas, the combined effects from the alternative groups for the Hanford Only, Lower Bound and Upper Bound waste volumes, or for the No Action Alternative for the Hanford Only and Lower Bound waste volumes, when added to the impacts of these other activities, are small.

The HSW EIS evaluates the consequences of various site-specific alternatives to the ongoing waste management program at Hanford, consistent with WM PEIS (DOE 1997b) decisions regarding certain TRU waste, LLW, and MLLW streams. Site-specific waste management actions at Hanford involve transportation, treatment and processing of TRU waste and MLLW, disposal of LLW, MLLW and ILAW, and storage of LLW, MLLW, and TRU waste. A discussion of the WM PEIS and other NEPA review documents relevant to the HSW EIS can be found in Volume I Section 1.5.

The WM PEIS was a comprehensive evaluation of DOE nationwide waste management. The WM PEIS evaluated a broad suite of alternatives for waste management across the DOE complex, including managing most waste at generator facilities, or consolidating waste management at fewer sites that have existing facilities suitable to accept waste from other facilities. The impacts of those alternatives were compared for a variety of waste volumes at different DOE sites, including larger quantities of waste than are evaluated in the HSW EIS. The general result of the WM PEIS was that radioactive and hazardous wastes generated at a DOE site should be disposed of at that site unless the site was not capable of or not technically able to support those actions. DOE determined there was sufficient information in the WM PEIS to support decisions regarding the sites that were suitable for long-term waste management missions. Those decisions included processing and disposing of Hanford waste at Hanford, and the importation of wastes from other sites that could not adequately handle them. Decisions made as part of the WM PEIS made Hanford available for the disposal of low-level waste and mixed low-level waste from other DOE generators. The initial WM PEIS decisions related to LLW, MLLW, and TRU waste were issued between January 1998 and February 2000.

DOE's radioactive waste will continue to be disposed of in several states around the country where there are existing DOE and commercial disposal facilities. See Volume I, Figure 1.2.

In response to public comments, DOE has conducted a route- and generator-specific offsite transportation analysis using updated highway routing and 2000 census data. See Volume I Section 5.8 and Volume II Appendix H. The potential impacts identified in the updated evaluation are similar to those presented in the WM PEIS (DOE 1997b) and the WIPP SEIS-II (DOE 1997c), and would not change conclusions or DOE-wide waste management decisions based on those studies.

The total amount of radioactivity expected to leave Hanford is much greater than the amount of radioactivity expected to come to Hanford. About 400 MCi of radioactivity are currently onsite. About 375 MCi are expected to be shipped to the Waste Isolation Pilot Plant in New Mexico, the geologic repository for spent nuclear fuel and high-level waste proposed for Yucca Mountain in Nevada, and other places. Less than 10 MCi would be expected to come to Hanford even if all the offsite waste evaluated in this HSW EIS were to come to Hanford. See Volume I Section 1 Figure 1.4.

Comments

E-0055/004

USDOE tries to say the impacts to groundwater are not very bad from the landfills by:
1) modeling the impact to groundwater at a point far outside the fence line or away from the edge of the burial grounds - this is an illegal change in the point of compliance as advocated by the Bush Administration to relax standards;
2) failing to include the cumulative impact of the existing burial grounds, and USDOE's plan to do NOTHING to clean them up and clean up the groundwater under them, while modeling the impact of adding more waste in new mega trenches;
3) failing to close the unlined LLW burial grounds by the end of this year, to start the cleanup of the contamination spreading from these illegal burial grounds - and, allowing dumping in unlined trenches to continue at an accelerated pace for several years!
4) failing to install legally adequate groundwater and soil column monitoring around the burial grounds - which would require installation of over 120 new monitoring wells (USDOE uses the lack of data to crazily claim no impact, and then say this proves there won't be an impact from the new trenches. Most of the monitoring wells do not reach groundwater any more, and more go dry every year. You can't monitor groundwater without the well reaching the groundwater); using a model for contamination that leaves out some of the most mobile and dangerous radionuclides, and totally ignoring the hazardous wastes and their role mobilizing other contamination as solvents (these wastes include the powerful solvents that USDOE uses and used for Plutonium processing. Of course, they are really good at mobilizing Plutonium and other radionuclides in soil as well, which USDOE ignores. In fact, USDOE pretends that it has a good track record of keeping hazardous waste out of the Low-Level Burial Grounds);
5) failing to apply Washington State's standards for groundwater and for protection of public health from toxic waste sites, instead USDOE claims its new mega trenches and existing burial grounds are safe by substituting much weaker standards that allow for many times more cancer deaths than Washington state standards allow for landfills and toxic waste dumps;
6) ignoring the poisonous and carcinogenic Carbon Tetrachloride spreading from existing burial grounds, with release of vapors that are at levels which can be fatal. Carbon tetrachloride is present in the air in at least one of the Low-Level Burial Ground trenches, in an operating burial ground with open trenches just a few yards away, at levels that are nearly twice the lowest air concentrations known to be fatal to humans and 176 times the OSHA Permissible Exposure Limit for workers. USDOE fails to even propose to look for related chemicals that were disposed in the same places. USDOE ignores this in modeling impacts from its new massive mega trenches, as well as failing to disclose and consider the impacts from its existing trenches.

Response

The results of past activities and groundwater monitoring data cannot be used to predict future impacts of LLBG disposal activities. Models have been used in the HSW EIS evaluations to estimate potential future groundwater impacts.

The maximum point of impact from multiple and widely dispersed sources may not necessarily be directly underneath the Low Level Burial Grounds or at the Low Level Burial Ground boundary. To model the groundwater impacts from multiple and widely dispersed disposal units over long periods of time, a 1-km point of analysis location was deemed to be more appropriate and representative than a regulatory point of compliance well location, for purposes of NEPA analysis. The point of analysis approach is considered technically appropriate for a NEPA evaluation of groundwater impacts over the long-term (10,000 years) time period analyzed. The 1-km point of analysis is not intended to represent the proposed locations for actual monitoring wells that would be used during the operational and closure time period. Groundwater impacts at the facility boundary (about 100 meters) have been added to the impacts identified for the preferred alternative and are discussed qualitatively for the other alternatives. A discussion of the differences between the 1-km point of analysis and the disposal facility boundary is provided in Volume I Section 5.3 and Volume II Appendix G.

General

The HSW EIS uses the definition of cumulative impact as defined by the CEQ Regulations (40 CFR 1508.7): "Cumulative impact" is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Potential cumulative impacts associated with implementing the HSW EIS alternative groups are summarized in Volume I Section 5.14. Past, current, and future Hanford activities include treatment and disposal of tank waste, CERCLA remediation projects, previously disposed of waste, decontamination and decommissioning of the Hanford production reactors and other facilities, waste in the PUREX tunnels, operation of a commercial LLW disposal facility by U.S. Ecology, and operation of the Columbia Generating Station by Energy Northwest. Cumulative impacts of storage, treatment, and disposal activities for a range of waste volumes are evaluated and expanded in the final HSW EIS. For most resource and potential impact areas, the combined effects from the alternative groups for the Hanford Only, Lower Bound and Upper Bound waste volumes, or for the No Action Alternative for the Hanford Only and Lower Bound waste volumes, when added to the impacts of these other activities, are small.

The preferred alternative as described in Volume I Section 3.7 is to dispose of low level waste in newly constructed lined disposal facilities as soon as they are available. For purposes of analysis the HSW EIS assumes this would occur by 2007. MLLW is currently being, and will continue to be, disposed of in lined facilities.

However, the use of unlined trenches for disposal of low level waste is an established, legal, and environmentally protective method of low level waste disposal at both DOE and commercial facilities. As such, it is a reasonable alternative, under CEQ regulations, and must be analyzed. The HSW EIS considers a wide range of alternatives for disposal of low level waste in both lined and unlined facilities. Lined trench alternatives include leak detection and leachate collection capabilities. In addition, groundwater monitoring would be done in compliance with applicable RCRA and State hazardous waste, TPA, and DOE requirements to validate the performance of the disposal facilities.

Groundwater monitoring is conducted according to TPA requirements, the Hanford Dangerous Waste Management permit, and DOE Orders. Groundwater monitoring will be expanded as necessary according to agreements between DOE and regulatory agencies to support future waste management operations.

Hazardous chemicals in MLLW have been characterized and documented since the implementation of RCRA at DOE facilities beginning in 1987. MLLW currently in storage, and MLLW that may be received in the future, would be treated to applicable state or federal standards for land disposal. Therefore, disposal of that waste is not expected to present a hazard over the long term because the hazardous constituents would either be destroyed or stabilized by the treatment. Inventories of hazardous materials in stored and forecast waste are either very small, or consist of materials with low mobility. See Volume II Appendixes F and G.

Inventories of hazardous chemicals in waste were not generally maintained by industries in the United States prior to the implementation of RCRA. Consistent with these general practices, inventories of hazardous chemicals in radioactive waste were not required to be determined or documented before the application of RCRA to radioactive mixed waste at DOE facilities in late 1987. Wastes placed in the LLBGs before late 1987 have not been specifically characterized for hazardous chemical content, but they have been evaluated in the EIS alternatives relative to their radionuclide inventories. In addition, preliminary estimates of chemical inventories in this waste have been developed for analysis in the HSW EIS, and a summary of their potential impacts on groundwater has been added to Volume I Section 5.3 and Volume II Appendix G.

In addition, the October 23, 2003 Settlement Agreement contains proposed milestones in the M-91-03-01 Tri-Party Agreement Change Package for retrieval and characterization of suspect TRU waste retrievably stored in the Hanford LLBGs (United States of America and Ecology 2003). As part of that agreement, DOE will manage the retrievably stored LLBG waste under the following assumptions: (1) all retrievably stored suspect TRU waste in the LLBGs is potentially mixed waste; and (2) retrievably stored suspect TRU waste will be managed as mixed waste unless and until it is designated as non-mixed through the WAC 173-303 designation process.

Interactions among different types of waste that could potentially mobilize radionuclides have also been considered as part of the HSW EIS analysis. However, such interactions typically require specific chemical environments or large volumes of liquid as a mobilizing agent, neither of which are known to be present in the solid waste disposal facilities currently in use (see discussion in Volume II Appendix G). Possible effects of this type could be mitigated by selecting candidate disposal sites to avoid placing waste in locations where previous contamination exists.

Waste sites and residual soil contamination remaining at Hanford over the long term, and which are not specifically evaluated as part of the HSW EIS alternatives, have been evaluated previously as part of NEPA or CERCLA reviews. In those studies, the risks associated with older solid waste burials, tank waste residuals and leaks, and contaminated soil sites were found to be very small, even for alternatives that considered stabilization of the waste in place (DOE 1987, DOE and Ecology 1996, Bryce et al. 2002). Further evaluation of tank wastes is anticipated in the "Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site" (68 FR 1052). The cumulative groundwater impacts analysis in the HSW EIS also includes those wastes, as described in Volume I Section 5.14 and Volume II Appendix L.

DOE plans to characterize pre-1970 inactive burial grounds and contaminated soil sites, as well as the active LLBGs considered in the HSW EIS alternatives, under the RCRA past practice or CERCLA processes to determine whether further remedial action would be required before the facilities are closed. As part of that process, the long-term risks from these wastes would either be confirmed to be minimal, or the waste would be remediated by removal, stabilization, or other remedial actions to reduce its potential hazard. In all cases, the impacts from these previously disposed wastes would be the same for all alternative groups considered in the HSW EIS, and would not affect the comparisons of impacts among the alternatives or the decisions made regarding disposal of waste received in the future.

It should be noted that the long-term impact analyses presented in the EIS are based upon conservative assumptions including loss of institutional control, barrier (cap) failure, and no continuing maintenance. CERCLA and MTCA standards and other comparative benchmarks used in the EIS are based upon different assumptions such as continuing institutional control and maintenance of barriers. When these types of assumptions are applied to the disposal action evaluated in the HSW EIS the long-term impacts are substantially reduced. The HSW EIS has been revised in response to comments concerning the overly conservative nature of the EIS evaluations, to provide perspective on long-term performance when assumptions of continuing human ability to maintain barriers and controls are utilized. See for example, discussion of assumption of intact barriers, Volume I Section 5.3.5 and Volume II Appendix G Section G.4.

TPA Milestone M-15-00C requires all 200 Area, non-tank farm, pre-record of decision site investigation activities to be completed by December 31, 2008. Site characterization information generated from TPA remedial investigation and LLBG RCRA permitting activities has been used in development of the HSW EIS.

As indicated in Volume I Section 5.3, existing groundwater monitoring data does not indicate that releases from the LLBGs have occurred. As indicated in Volume I Section 4.5.3.3, the carbon tetrachloride in the groundwater under Low-Level Waste Management Area 4 is from an upgradient source. Groundwater impacts from Low-Level Waste Management Areas 1, 2, 3, and 4 are discussed in the Hanford Site-Groundwater Monitoring for Fiscal Year 2001 document (Hartman et al. 2002). Groundwater contamination beneath the Hanford Site is being studied and remediated by the ongoing CERCLA program in accordance with the Tri-Party Agreement. See Volume II Appendix N, Section N.2.4.

Sampling being conducted as part of the ongoing CERCLA program in the LLW Management Area 4 has indicated the presence of carbon tetrachloride vapors in and near several trenches. During the trench sampling, industrial hygienists conducted repeated air monitoring at the top of the vent risers above trenches—a required health and safety practice for all sampling activities to protect the workers from potentially being exposed during the sampling. After the carbon tetrachloride had been detected in the air at the bottom of the trench, industrial hygienists again monitored the trench to ensure that other workers who entered this area in the burial ground would not be exposed. The measurements for all "organics" in the air above the trench (including carbon tetrachloride and its decay products) showed readings ranging from "not detectable" to 4 ppm—well below the standard set by the Occupational Safety and Health Administration (OSHA) of 10 ppm per day during a 40-hour work week. Samples taken in the "breathing zone" did not show any level of organics. The monitoring at the surface of the trenches indicated that toxic vapors were not emanating from the vent risers. Monitoring above and below the surface continues. Based on monitoring results and activities to be performed, industrial hygienists specify protective measures to be taken to protect workers. Common measures might include protective clothing, respiratory protection, and removal of contaminants from the work area.

Additional sampling for organic compounds, including carbon tetrachloride, in the Low Level Burial Grounds is being conducted as part of the on-going TRU waste retrieval activities. This sampling started October 15, 2003 and is being conducted in accordance with a State of Washington Department of Ecology approved Sampling and Analysis Plan (SAP). Sampling results will be used both for helping reduce risks during retrieval and to provide information for remediation planning.

In response to carbon tetrachloride vapors found in previous vent riser sampling in trench 4 of LLBG 218-W-4C, a vapor extraction system has been installed and started operation November 15, 2003. This system is currently intended to operate until the carbon tetrachloride concentrations are less than or equal to 10 ppmv. This work is being conducted prior to retrieval in order to reduce the likelihood that higher levels of carbon tetrachloride will be encountered during retrieval that could pose a higher risk to workers and slow progress on retrieval.

Retrieval of the suspect transuranic waste from this burial ground has already started and is anticipated to be complete within the next few years, with Trench 4 retrieval completed by the end of 2006. If the retrievably stored waste is the source of the carbon tetrachloride vapors, the completion of this retrieval will eliminate the source of contamination. Additional sampling results from the SAP sampling after the removal of the retrievably stored waste will provide information to assist in determining appropriate actions after the waste is removed.

Comments

E-0047/006

Washington State law clearly requires that DOE protect groundwater and existing contamination resulting from past DOE actions hardly excuses from state law requiring cleanup of groundwater at Hanford to protect the most sensitive uses. The draft EIS fails to acknowledge or disclose the potential violations of state law that would result from the different management actions being considered and must comply with NEPA.

Question # 6 - Is it DOE's position that the Hanford site is currently in compliance with State standards related to ground water and surface water? Please explain.

Question #7- Is existing contamination at Hanford causing any exceedances of state or federal water quality standards for ground water or surface water? If so where?

Question # 8 - What is DOE's position on the legal requirements that it must meet in order to comply with Washington State law relating to the protection of groundwater?

The analysis in the draft EIS fails to recognize the serious lack of information and uncertainties that DOE has regarding the effect and fate of existing and potential future groundwater contamination at Hanford.

Question # 9- What is DOE's current position regarding the mobility of Uranium in ground water? Does DOE recognize that its previous assertions that Uranium is not mobile in groundwater as articulated in various 300 area cleanup decisions [are] incorrect in light of current data contradicting this assertion? If not, please explain. If so, please explain how this new information is reflected in the draft EIS.

The analysis in the draft EIS is also flawed because it fails to assess the effects of proposed actions on groundwater directly below planned management areas or disposal sites. Consistent with NEPA, DOE must consider all of the effects to ground water not merely the potential effects a kilometer or more away. Specifically, DOE must disclose whether there is the potential for various management options to violate state or federal law as a result of potential contamination.

Question # 10- What would the effects of various alternatives be on the groundwater immediately below and surrounding proposed waste disposal and management sites? Why is this information not considered or disclosed in the draft EIS?

E-0047/020

Washington Administrative Code 173-340 requires groundwater be restored to the highest beneficial standards, which it defines as meeting drinking water standards. It further clarifies an aquifer is considered a drinking water source unless it meets a set of criteria which the Hanford aquifer does not meet.

Response

The HSW EIS evaluates impacts to the Columbia River and downstream populations for about 10,000 years. For all alternatives analyzed in this HSW EIS, DOE has analyzed the long-term movement of contaminants through soil and groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be virtually indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark drinking water standards at a hypothetical well located near the Columbia River. The impacts of groundwater reaching the river are discussed in Volume I Sections 5.3 and Volume II Appendix G. See also Volume I Section 5.11 and 5.14 and Volume II Appendixes F and L.

As a result of additional mitigation measures incorporated into the action alternatives, the impact of the proposed action on groundwater at the 1-km line of analysis would be below benchmark drinking water standards. The discussion of Irreversible and Irretrievable Commitments of Resources in Volume I Section 5.15 has been revised in this EIS.

Groundwater contamination beneath the Hanford Site is being studied and remediated by the ongoing CERCLA program in accordance with the Tri-Party Agreement. The CERCLA process considers legally applicable Federal, State, and local laws or relevant and appropriate requirements (ARARs). Any decisions reached by DOE on the basis of analysis in the HSW EIS would be implemented in accordance with applicable Federal, State, and local laws and regulations. See Volume II Appendix N, Section N.2.4.

The maximum point of impact from multiple and widely dispersed sources may not necessarily be directly underneath the Low Level Burial Grounds or at the Low Level Burial Ground boundary. To model the groundwater impacts from multiple and widely dispersed disposal units over long periods of time, a 1-km point of analysis location was deemed to be more appropriate and representative than a regulatory point of compliance well location, for purposes of NEPA analysis. The point of analysis approach is considered technically appropriate for a NEPA evaluation of groundwater impacts over the long-term (10,000 years) time period analyzed. The 1-km point of analysis is not intended to represent the proposed locations for actual monitoring wells that would be used during the operational and closure time period. Groundwater impacts at the facility boundary (about 100 meters) have been added to the impacts identified for the preferred alternative and are discussed qualitatively for the other alternatives. A discussion of the differences between the 1-km point of analysis and the disposal facility boundary is provided in Volume I Section 5.3 and Volume II Appendix G.

Information on uranium mobility can be found in Volume II Appendix G.

It should be noted that the long-term impact analyses presented in the EIS are based upon conservative assumptions including loss of institutional control, barrier (cap) failure, and no continuing maintenance. CERCLA and MTCA standards and other comparative benchmarks used in the EIS are based upon different assumptions such as continuing institutional control and maintenance of barriers. When these types of assumptions are applied to the disposal action evaluated in the HSW EIS the long-term impacts are substantially reduced. The HSW EIS has been revised in response to comments concerning the overly conservative nature of the EIS evaluations, to provide perspective on long-term performance when assumptions of continuing human ability to maintain barriers and controls are utilized. See for example, discussion of assumption of intact barriers, Volume I Section 5.3.5 and Volume II Appendix G Section G.4.

Volume I Section 4.5 discusses hydrology, surface water, and groundwater quality. Additional information can be found in the Hanford Site Environmental Report 2001 (Poston et al. 2002) and the Hanford Site National Environmental Policy Act (NEPA) Characterization document (Neitzel 2002).

Several mitigation measures have been built into the alternatives addressed in the final HSW EIS, including installation of barriers, liners, and leachate collection systems in disposal facilities; treatment of MLLW to meet applicable RCRA and state requirements; and in-trench grouting or use of HICs for Cat 3 LLW and MLLW. Revised analyses in the final HSW EIS indicate that such measures would reduce the estimated releases and levels of groundwater contamination. As set forth in Volume I Section 5.3, for the action alternatives, constituent concentrations in groundwater at 1 km from the disposal facilities are expected to be below the benchmark drinking water standards. Water quality in the Columbia River would be virtually indistinguishable from the current background levels.

Comments

L-0054/012

Fifth, the SW EIS fails to consider a reasonable range of alternatives for certain waste streams, such as MLLW, that explored off-site disposal.

General

Response

The HSW EIS evaluates the consequences of various site-specific alternatives to the ongoing waste management program at Hanford, consistent with WM PEIS decisions regarding certain TRU, LLW, and MLLW streams. A discussion of the WM PEIS and other NEPA review documents relevant to the HSW EIS can be found in Volume I Section 1.5.

Comparisons of low-level waste (LLW) and mixed low-level waste (MLLW) disposal at various DOE sites have been presented in the WM PEIS (DOE 1997b) and in various site-specific NEPA documents.

Comments

L-0044/116

In summary, we believe the Revised Draft HSW-EIS provides an improved level of information. Additional information and clarity is needed if the Final HSW-EIS is to comply with NEPA, fully define mitigation measures, and effectively inform the handling of waste that is currently at Hanford or expected to be generated in the cleanup of Hanford. Additional information is needed to address the cumulative impacts and appropriate treatment capabilities needed to process non-Hanford waste.

Response

The HSW EIS provides important environmental information to assist DOE in making decisions about site-specific storage, treatment, and disposal actions at Hanford.

The HSW EIS summarizes its analyses in seven (7) sections in a first volume. The supporting technical detail is presented in fifteen (15) appendixes in a second volume. The Comment Response Document makes up the third and fourth volumes of the HSW EIS.

The HSW EIS uses the definition of cumulative impact as defined by the CEQ Regulations (40 CFR 1508.7): "Cumulative impact" is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Potential cumulative impacts associated with implementing the HSW EIS alternative groups are summarized in Volume I Section 5.14. Past, current, and future Hanford activities include treatment and disposal of tank waste, CERCLA remediation projects, previously disposed of waste, decontamination and decommissioning of the Hanford production reactors and other facilities, waste in the PUREX tunnels, operation of a commercial LLW disposal facility by U.S. Ecology, and operation of the Columbia Generating Station by Energy Northwest. Cumulative impacts of storage, treatment, and disposal activities for a range of waste volumes are evaluated and expanded in the final HSW EIS. For most resource and potential impact areas, the combined effects from the alternative groups for the Hanford Only, Lower Bound and Upper Bound waste volumes, or for the No Action Alternative for the Hanford Only and Lower Bound waste volumes, when added to the impacts of these other activities, are small.

Hanford is part of a nationwide cleanup effort of over 100 DOE sites and cooperates with these sites in the cleanup. As part of that effort, Hanford would receive some LLW, MLLW, and would temporarily store some TRU waste from other DOE sites, as well as send HLW, spent nuclear fuel, and TRU waste to other DOE sites. The HSW EIS evaluates a range of waste receipts at Hanford to encompass the uncertainties regarding quantities of waste that would ultimately be managed at the site. The waste volumes evaluated include a Lower Bound waste volume consisting mainly of Hanford waste, and an Upper Bound volume that includes additional quantities of offsite waste that Hanford might receive consistent with WM PEIS decisions. The HSW EIS includes an evaluation of Hanford Only waste. The Hanford waste evaluation provides a basis with which to determine the impacts of varying quantities of offsite waste at Hanford. Evaluations in the WM PEIS, the HSW EIS, and related NEPA documents indicate that additional wastes could be handled at Hanford without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. Information on the potential impacts of transporting waste has been revised and is presented in Volume I Section 5.8 and Volume II Appendix H.

Several mitigation measures have been built into the alternatives addressed in the final HSW EIS, including installation of barriers, liners, and leachate collection systems in disposal facilities; treatment of MLLW to meet applicable RCRA and state requirements; and in-trench grouting or use of HICs for Cat 3 LLW and MLLW. Revised analyses in the final HSW EIS indicate that such measures would reduce the estimated releases and levels of groundwater contamination. As set forth in Volume I Section 5.3, for the action alternatives, constituent concentrations in groundwater at 1 km from the disposal facilities are expected to be below the benchmark drinking water standards. Water quality in the Columbia River would be virtually indistinguishable from the current background levels.

DOE believes this HSW EIS complies with applicable NEPA requirements.

Comments

E-0043/063, EM-0217/063, EM-0218/063, L-0056/063, LM-0017/063, LM-0018/063

1) The HSW EIS analyzes the disposal of mixed low-level waste (MLLW) without a prior decision by the State of Washington to dispose of MLLW at Hanford. As per the Resource Conservation and Recovery Act (RCRA), the State of Washington has jurisdiction over the disposal of MLLW because of its hazardous waste properties. Thus, the HSW EIS should be limited to evaluating only the short-term storage and treatment of MLLW, not the disposal of MLLW. GAP urges the State of Washington to refuse to permit the DOE increase the volume of MLLW disposed of at Hanford beyond what was decided for Hanford cleanup;

2) The EIS should compare disposal of LLW/MLLW at different sites;

3) The EIS should compare disposal of Hanford-only versus off-site waste;

4) The EIS' scope should include all previously buried and newly generated solid waste;

5) The EIS should assess the difference in impacts between disposal of low and high volumes of waste;

6) The EIS should address the hazardous waste component of
  i. The quantity of waste that will remain at Hanford,
  ii. The quantity of waste that Hanford will export,
  iii. The quantity of new waste that Hanford will accept;

7) The EIS should analyze the lack of plans to retrieve or mitigate the impacts from TRU waste buried before 1970;

8) The EIS should analyze the impacts of hazardous waste buried with various forms of radioactive waste (e.g. lead shielding);

9) The EIS should analyze the decision to move one-half of the waste out of the Central Waste Complex; and

10) The EIS should include liquid effluent retention [treatment] facility waste contributions from the waste treatment plant.

Response

Federal RCRA Subtitle C and related state hazardous waste management regulations require that radioactive mixed waste land disposal units meet minimum technical standards to prevent the release of hazardous substances. The standards include a system of multiple liners to prevent leakage into groundwater, a leachate collection system, groundwater monitoring wells, a multi-layer cap to prevent infiltration of rain and snow, stringent waste treatment standards, and a program of monitoring, inspection, and reporting during the period of operation and after closure. These standards will apply to all new mixed waste disposal units evaluated in the HSW EIS. Volume I Section 2.2.3 discusses disposal facilities and their environmental protection features.

DOE is permitted under RCRA interim status authorization to dispose of MLLW at Hanford. The text has been revised to indicate that DOE is working with Ecology to determine the extent of LLBG coverage in the final status permit. Appropriate investigation of waste disposed in the LLBGs prior to 1987 would be made in accordance with applicable CERCLA or RCRA requirements.

The HSW EIS evaluates the consequences of various site-specific alternatives to the ongoing waste management program at Hanford, consistent with WM PEIS (DOE 1997b) decisions regarding certain TRU waste, LLW, and MLLW streams. Site-specific waste management actions at Hanford involve transportation, treatment and processing of TRU waste and MLLW, disposal of LLW, MLLW and ILAW, and storage of LLW, MLLW, and TRU waste. A discussion of the WM PEIS and other NEPA review documents relevant to the HSW EIS can be found in Volume I Section 1.5.

The WM PEIS was a comprehensive evaluation of DOE nationwide waste management. The WM PEIS evaluated a broad suite of alternatives for waste management across the DOE complex, including managing most waste at generator facilities, or consolidating waste management at fewer sites that have existing facilities suitable to accept waste from other facilities. The impacts of those alternatives were compared for a variety of waste volumes at different DOE sites, including larger quantities of waste than are evaluated in the HSW EIS. The general result of the WM PEIS was that radioactive and hazardous wastes generated at a DOE site should be disposed of at that site unless the site was not capable of or not technically able to support those actions. DOE determined there was sufficient information in the WM PEIS to support decisions regarding the sites that were suitable for long-term waste management missions. Those decisions included processing and disposing of Hanford waste at Hanford, and the importation of wastes from other sites that could not adequately handle them. Decisions made as part of the WM PEIS made Hanford available for the disposal of low-level waste and mixed low-level waste from other DOE generators. The initial WM PEIS decisions related to LLW, MLLW, and TRU waste were issued between January 1998 and February 2000.

Hanford is part of a nationwide cleanup effort of over 100 DOE sites and cooperates with these sites in the cleanup. As part of that effort, Hanford would receive some LLW, MLLW, and would temporarily store some TRU waste from other DOE sites, as well as send HLW, spent nuclear fuel, and TRU waste to other DOE sites. The HSW EIS evaluates a range of waste receipts at Hanford to encompass the uncertainties regarding quantities of waste that would ultimately be managed at the site. The waste volumes evaluated include a Lower Bound waste volume consisting mainly of Hanford waste, and an Upper Bound volume that includes additional quantities of offsite waste that Hanford might receive consistent with WM PEIS decisions. The HSW EIS includes an evaluation of Hanford Only waste. The Hanford waste evaluation provides a basis with which to determine the impacts of varying quantities of offsite waste at Hanford. Evaluations in the WM PEIS, the HSW EIS, and related NEPA documents indicate that additional wastes could be handled at Hanford without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities. Information on the potential impacts of transporting waste has been revised and is presented in Volume I Section 5.8 and Volume II Appendix H.

The HSW EIS includes the impacts of all LLBG previously disposed waste in its evaluations of long-term groundwater impacts in Volume I Section 5.3, Volume I Section 5.11, Volume I Section 5.14, and in Volume II Appendixes F, G, and L. LLBG previously disposed waste includes LLW disposed of since 1962, LLW disposed before and after the regulatory definition of TRU promulgated in 1970, and wastes disposed before and after the application of RCRA hazardous waste management standards to certain Hanford LLW streams in 1987. The HSW EIS impact estimates are based on chemical and radionuclide inventories. Past-buried LLBG wastes will be addressed within the framework for managing RCRA past practice and CERCLA units established under the TPA.

DOE is preparing the Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single Shell Tanks at the Hanford Site (68 FR 1052), which will address the potential environmental impacts from retrieving and processing tank wastes. DOE will conduct appropriate environmental review to support future decisions for closing the vitrification plant (i.e., Waste Treatment Plant) and other existing treatment and associated facilities.

The decision to ship the 183-H waste ("one-half of the waste out of the Central Waste Complex") to ERDF for disposal was made through the CERCLA process.

Comments

L-0041/057

Oregon expects the DOE to use a "defense-in-depth" design philosophy when planning for the disposal of waste at Hanford. This means that each major component of the waste disposal system, including the waste form and containers themselves, will be designed with defense-in-depth as a primary criterion and the integrated system will also use defense-in-depth principles in its design. Following are some specific expectations and recommendations for future operations of solid waste disposal facilities at Hanford:

a) Ensure that selected alternatives comply with prevailing state and federal regulations for the disposal of hazardous and radioactive waste. When conflicts arise, apply the more stringent regulation due to the uncertainty associated with risk assessment and numerical modeling of contaminants. For example, DOE has indicated that radiological dose (25 mrem/yr.) will be exceeded in the future. EPA requirements are more stringent and based on a risk threshold of 3 x 10-4. This risk level corresponds to about 15 mrem/yr. Therefore, DOE should include redundancy factors in the design of facility to meet this tighter performance threshold.

b) Conduct landfill-siting studies to determine the meso-scale physical structure of the waste site including the vadose zone. Conduct direct hydrological testing to verify the placement of vadose and groundwater monitoring wells. Establish a consistent infiltration value. The EIS and key supporting documents used different infiltration rates that vary over several orders of magnitude. (0.01cm to 0.50 mm/yr.). Actual infiltration in disturbed areas has been observed to be as high as 50-100 cm/yr. Problems with operational design have aggravated this further by creating slopes that drive water into contaminated areas, such as the T tank farm. This results in local inundation and flooding which is not easily modeled with a fixed infiltration rate approach.

c) Incorporate redundant elements into landfill design such as reactive layers, geosynthetic and clay liners, and soil amendments in the cushion to provide defense-in-depth against the leaching and transport of contaminants. Capillary break barriers should be incorporated into the design.

d) Modify daily cover materials to provide additional contaminant adsorption sites by blending apatite or similar materials to sequester the contaminants.

e) Conduct site specific numerical fate and transport modeling to demonstrate impact on the environment, including the vadose and saturated zone directly beneath the waste site. The Representative Elemental Volume used in the modeling should be matched to the density of information collected. The model must reflect the level of aquifer mixing that occurs based upon detailed field information collected during the sites hydraulic test.

f) Evaluate each contaminant's partitioning coefficient (Kd) in soils taken directly from the proposed site, recognizing the waste form chemistry may effect the mobility of contaminant.

g) Construct a section of the proposed final cover to verify the 0.01 cm/yr. infiltration rate incorporated into the EIS. The proposed final cover should also be used to verify the establishment and subsequent durability of the proposed plant community.

h) Install soil moisture monitors into the waste form, cushion, and below the liner system to monitor changes in soil moisture in response to construction and eventual closure of the landfill cells.

i) Develop a landfill-filling plan that is based upon waste compatibility issues and baseline projections of annual waste stream volumes and mass. The filling plan should be related to the operations and maintenance plan. During operations, management of leachate will be a primary concern.

j) Develop a preliminary closure and monitoring plan, to meet the substantive requirements of the Model Toxics Control Act.

k) Present all plans and documents to stakeholders prior to construction.

l) Gather information necessary to complete the Natural Resource Damage Assessment for the 200 Area prior to construction of the first landfill cell. Much of the 200 area seems to be slated for long term disposal of radioactive and hazardous waste. This action eliminates future use of the existing habitat and establishes a requirement for long term actions to manage the disposal site. Quantifying injury to natural resources under CERCLA must be completed prior to construction of waste sites so that compensatory mitigation can be determined. Additionally, by assessing damage prior to construction, appropriate mitigation actions can be incorporated into design and implementation plans, thereby improving project efficiency and minimizing impacts.

m) Develop performance criteria for:
- -site, including a large scale infiltration test
- -vadose and groundwater monitoring system
- -liner system, including construction quality assurance
- -leachate collection system
- -cushion system
- -waste form
- -daily cover material
- -dust suppression and water treatment
- -final grading material
- -cap system

Response

As a result of additional mitigation measures incorporated into the action alternatives, the impact of the proposed action on groundwater at the 1-km line of analysis would be below benchmark drinking water standards. The discussion of Irreversible and Irretrievable Commitments of Resources in Volume I Section 5.15 has been revised in this EIS.

It should be noted that the long-term impact analyses presented in the EIS are based upon conservative assumptions including loss of institutional control, barrier (cap) failure, and no continuing maintenance. CERCLA and MTCA standards and other comparative benchmarks used in the EIS are based upon different assumptions such as continuing institutional control and maintenance of barriers. When these types of assumptions are applied to the disposal action evaluated in the HSW EIS the long-term impacts are substantially reduced. The HSW EIS has been revised in response to comments concerning the overly conservative nature of the EIS evaluations, to provide perspective on long-term performance when assumptions of continuing human ability to maintain barriers and controls are utilized. See for example, discussion of assumption of intact barriers, Volume I Section 5.3.5 and Volume II Appendix G Section G.4.

DOE and NRC regulated LLW disposal facilities are subject to the 25 mrem per year standard in DOE Order 435.1 (DOE 2001b) and 10 CFR 61, respectively. The Washington State Department of Health has adopted the NRC standard. EPA has not promulgated a 15 mrem per year standard.

DOE believes this HSW EIS complies with applicable NEPA requirements.

Volume I Section 6 identifies the major statutes, permits, compliance agreements, and regulatory requirements followed in conducting operations at Hanford Site. Statutes include AEA, CERCLA, RCRA and the State of Washington Hazardous Waste Management Act. Volume I Section 6.3 discusses the TPA. Volume I Section 6.4 discusses the Dangerous Waste Management permit. Volume I Section 6.19 provides a summary of existing and potential permits (including state approved permits where state decision-making will be necessary) required to construct and operate treatment, storage, and disposal facilities related to the HSW EIS alternatives. Volume I Section 6 has been updated and revised in response to comments in the final HSW EIS.

The HSW EIS uses the best available data, computer modeling, assumptions, and related methods to produce estimates of reasonably foreseeable environmental impacts. The modeling approach was consistently applied to each alternative, and it provided information that allowed comparison of the alternatives.

Comments

P-0077/001

70,000 Truckloads of nuclear waste should not be transported to Hanford. The danger from leakage is already extreme. What is there already needs to be cleaned up. The serious problem that currently exists will only be exacerbated by additional waste. Contamination of the Columbia River is much too great a risk to take.

Response

The HSW EIS estimates that up to 33,900 shipments of LLW, MLLW, and TRU waste could be shipped to Hanford if the upper bound waste volumes are realized. The actual number of shipments is expected to be less than this.

The Hanford Only waste volume has been evaluated in all action alternatives and the No Action Alternative to provide a better comparison with the impacts of adding offsite waste. The incremental impacts of offsite waste are the differences between the Lower and Upper Bound Volumes and the Hanford Only impacts for a given alternative.

The HSW EIS evaluates impacts to the Columbia River and downstream populations for about 10,000 years. For all alternatives analyzed in this HSW EIS, DOE has analyzed the long-term movement of contaminants through soil and groundwater to the Columbia River. In all cases, it found that the water quality of the Columbia River would be virtually indistinguishable from the current river background levels. The concentrations of all the constituent contaminants were well below benchmark drinking water standards at a hypothetical well located near the Columbia River. The impacts of groundwater reaching the river are discussed in Volume I Sections 5.3 and Volume II Appendix G. See also Volume I Section 5.11 and 5.14 and Volume II Appendixes F and L.

The HSW EIS evaluates several alternatives for the storage, treatment, and processing of waste from onsite and offsite generators. Evaluations in the WM PEIS, the HSW EIS, and related NEPA documents indicate that additional wastes could be handled at Hanford without complicating future remediations, or diverting resources or disposal capacity from other Hanford cleanup activities.

Comments

THR-0008/003

What's going to happen two, three generations from now? The people who depend on the river for cultural resources, what happens to them? I'm talking about the Tribes. This is a waiting form of genocide[.]

TSE-0029/002

But on page S.37 of this summary, I just wanted to point out a couple of weasel words about mitigation here. Weasel words are like we could take, or might occur, or potential mitigation, or we could mitigate. And this is in relation to how they are going to treat the tribal cultural resources that they find, they are going to determine appropriate management actions with the tribe.

Response

Several mitigation measures have been built into the alternatives addressed in the final HSW EIS, including installation of barriers, liners, and leachate collection systems in disposal facilities; treatment of MLLW to meet applicable RCRA and state requirements; and in-trench grouting or use of HICs for Cat 3 LLW and MLLW.

DOE does not and will not rely solely on long-term stewardship to protect people and the environment. As indicated in the DOE sponsored report "Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites" (National Research Council 2000), "contaminant reduction is preferred to contaminant isolation and the imposition of stewardship measures." Contaminant reduction is a large part of the ongoing cleanup efforts at Hanford. Most of the analyses in the HSW EIS are based on the assumption that long-term institutional controls would no longer be in effect 100 years after closure (about 2150 AD). Long-term groundwater impacts and subsequent human health impacts were determined based on the assumption that caps would degrade and eventually provide no protection (see Volume I Sections 5.3 and 5.11 and Volume II Appendices F and G). In addition, "intruder scenarios" are analyzed to determine the impacts of gaining access to the site (i.e., no institutional controls) and digging or drilling into waste sites. See Volume I Section 5.11.2.2 and Volume II Appendix F Section F.3. Further information on DOE's long-term stewardship activities can be found in the DOE Long-Term Stewardship Study (DOE 2001a). The discussions of long-term stewardship in Volume I Sections 2.2.7 and 5.18 of the HSW EIS have been revised in response to comments.

TPA Milestone M-15-00C requires all 200 Area, non-tank farm, pre-record of decision site investigation activities to be completed by December 31, 2008. Site characterization information generated from TPA remedial investigation and LLBG RCRA permitting activities has been used in development of the HSW EIS.

An expanded discussion of potential mitigation measures is in Volume I Section 5.18.

DOE is cognizant of the concerns of Native Americans and others that operations at Hanford, including those discussed in this HSW EIS, could potentially adversely impact Native Americans and their lifestyle. This HSW EIS includes discussion of potential impacts to cultural resources in Volume I Section 5.7, aesthetic and scenic resources in Volume I Section 5.12, and environmental justice in Volume I Section 5.13.

Comments

L-0030/003

I believe that radioactive waste and chemical waste should be stored in the State from which it originates, and probably encased in glass.

L-0051/003

Instead of this plan [to transport waste to Hanford], could the waste just be left at the various sites where it currently is? I'm supposing that those sites are contaminated and in need of clean-up anyway; why not make it as safe as possible (vitrify it?) and clean up the sites, using money saved from not having to transport it?

L-0058/002

The waste should be given back to its producers for disposal.

P-0106/001

I oppose centralized location of waste. It should be stored and made safe at its source. Why should others, who received no benefit from creation of the waste, be made to suffer the possible consequences of its storage? IF places are safe for production, they are safe for disposal and storage.

P-0170/001

Why are we in Washington State taking other states' nuclear waste? We are already the nations most contaminated waste site - shipping 70,000 truckloads of radioactive and chemical waste isn't going to help -

THR-0010/004

I can't even believe it, that we are here discussing that the government wants to send more nuclear waste to Hanford.

TPO-0026/003

It's fairly clear that we don't really have a clear and comprehensive plan of how we're going to deal with the waste across the set of complexes.

General

TSE-0013/003

You know, does it seem right if you have most of the nation's nuclear waste in this location, does it make sense, if you don't know exactly what you have in this huge legacy of nuclear waste, it's not accurately characterized, it is in unlined trenches. A very potent and pertinent question is, how can you possibly have the luxury of talking about, for political reasons or other reasons, of relieving wastes from other sites? It's not we are not willing to do our share, it's not in our backyard. It is about the health and safety of human beings and the environment to get a handle on what you have, handle on what we have, enough to satisfy at least some of us in the public.

Response

The HSW EIS evaluates the consequences of various site-specific alternatives to the ongoing waste management program at Hanford, consistent with WM PEIS (DOE 1997b) decisions regarding certain TRU waste, LLW, and MLLW streams. Site-specific waste management actions at Hanford involve transportation, treatment and processing of TRU waste and MLLW, disposal of LLW, MLLW and ILAW, and storage of LLW, MLLW, and TRU waste. A discussion of the WM PEIS and other NEPA review documents relevant to the HSW EIS can be found in Volume I Section 1.5.

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DOE's radioactive waste will continue to be disposed of in several states around the country where there are existing DOE and commercial disposal facilities. See Volume I, Figure 1.2.

Comments

E-0013/001

Please understand how opposed people are to the trucking of dangerous waste to Hanford. We are vehemently against this unwise, unsafe, and unprecedented dumping. If the waste itself were not horrific enough, the careless pit dumping of it in proximity to the Columbia is beyond on sense of reason or integrity.

Response

The HSW EIS considers a wide range of alternatives for disposal of low level waste in both lined and unlined facilities. Lined trench alternatives include leak detection and leachate collection capabilities. In addition, groundwater monitoring would be done in compliance with applicable RCRA and State hazardous waste, TPA, and DOE requirements to validate the performance of the disposal facilities. The preferred alternative is to dispose of low level waste in newly constructed lined disposal facilities as soon as they are available. For purposes of analysis the HSW EIS assumes this would occur by 2007. MLLW is currently being, and will continue to be, disposed of in lined facilities. The EIS includes discussion of the cumulative effects of past, present, and reasonably foreseeable actions. See Volume I Section 5.14 and Volume II Appendix L.

The Hanford Only waste volume has been evaluated in all action alternatives and the No Action Alternative to provide a better comparison with the impacts of adding offsite waste. The incremental impacts of offsite waste are the differences between the Lower and Upper Bound Volumes and the Hanford Only impacts for a given alternative.

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Comments

E-0019/006, L-0026/006

The draft HSW-EIS should be revised using data developed for the Tank Retrieval and Closure Environmental Impact Statement

L-0052/013

As such [because of the addition of ILAW] we have concerns about how this EIS will interact with the tank closure EIS to be reviewed in the fall.

Response

The HSW EIS uses best available data for estimating inventories of hazardous and radioactive wastes. These data are obtained from information management systems maintained at Hanford and other DOE sites. The Office of River Protection has contributed data to these information management systems.

The scope of the HSW EIS is to evaluate the potential environmental impacts of ongoing activities of the Hanford Solid Waste Program and to evaluate implementation of alternatives consistent with the WM PEIS. The HSW EIS evaluates reasonably foreseeable treatment, storage, and disposal facilities and activities for LLW, MLLW, and TRU waste. It also evaluates disposal of ILAW in a form that has performance characteristics equivalent to borosilicate glass.

The Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of